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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/770,941

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Chad A. Cobbley

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03/22/2005

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EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/770,941

Applicant(s)

COBBLEY ET AL.

Examiner

David S. Blum

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 8-18 is/are rejected.
- 7) ☒ Claim(s) 2,3,6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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This action is in response to the amendment filed 12/13/04.

DETAILED ACTION

Claim Objections

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 11-13 and 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Jiang (US 6,343,019).

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Jiang teaches all of the positive steps of claims 1, 11-13, and 15-16 in that a stack is formed of at least two die (20 and 42) and the stack is placed on a temporary holding surface (column 3 lines 55-58, "the outer die and inner die may be secured to each other prior to being mounted in the first recess". If they are mounted to each other, there must exist some form of temporary holding surface. Without a temporary holding surface, the die would fall to the floor or bottom of the apparatus).

Regarding claim 11, the stack is placed into a recess (18) of a wafer as described above, thus the stack is placed onto a wafer.

Regarding claim 12, the stack may be formed (or secured to the substrate) by the use of adhesive tape (column 3 line 62), thus a tape reel.

Regarding claim 13, the stack is attached to a substrate (column 3 lines 52-60).

Regarding claim 15, the stack is a single stack (figure 6).

Regarding claim 16, the stack is removed from the temporary holding surface and the stack is used to form an integrated circuit package (abstract, and column 3 lines 16 and 29).

Claim Rejections - 35 USC § 103

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3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-9, 14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (US 6,343,019) in view of Pai (US 6,503,776).

Jiang teaches all the positive steps of claims 8-9, 14, and 17-18 as recited above, except for forming a stack of at least three semiconductor die.

Regarding claim 8 Jiang teaches stacking two semiconductor die, but also "the present invention can be applied to other geometry die and die arrangements". This is suggestive of three or more die in the stack. Pai teaches a die stack comprising three (110, 160, and 130) die. Pai teaches multi-chip modules help minimize the system operational speed restrictions imposed by long printed circuits (column 1 lines 16-18).

Regarding claim 14, Pai teaches when using adhesive in a multi-stack, the second adhesive should have a lower curing temperature (exothermic temperature) than that of the first adhesive (column 3 lines 29-37).

Regarding claim 9, the adhesive of Pai may be a film adhesive, thus the stack is placed upon a film frame (column 4 lines 2).

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Regarding claim 17, Pai teaches that it is known to use stacked chips in connection with processors (thus forming an electronic system) to minimize the system operational speed restrictions imposed by long printed circuits (column 1 lines 16-19).

Regarding claim 18, the stacked die comprises a memory die (column 1 line 18).

It would be obvious to one skilled in the requisite art at the time of the invention to modify Jiang by increasing the stack to at least three chips as taught by Pai to minimize the system operational speed restrictions imposed by long printed circuits (column 1 lines 16-18).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (US 6,343,019) in view of Pai (US 6,503,776) and in further views of Moden (US 5,719,440).

Jiang and Pai teach all the positive steps of claim 10 as recited above, except for adhering the die in the stack with a gel. Jiang and Pai teach an adhesive or adhesive tape or film. Moden teaches bonding "to an upper surface of a master board with an adhesive, which may comprise a liquid or gel adhesive, or an adhesive tape, all as known in the art". (column 4 lines 46-49) Thus the three have art recognized equivalence for this purpose.

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It would be obvious to one skilled in the requisite art at the time of the invention to modify Jiang and Pai by using a gel as taught by Moden to be well known in the art as an equivalence to tape.

Allowable Subject Matter

6. Claims 2-3 and 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2-3 and 6-7 are based upon claim 1, rejected under USC 101, double patenting, of a claim in issued patent US 6682955.

Response to Arguments

7. Applicant's arguments filed 12/13/04 have been fully considered but they are not persuasive.

The applicant argues against the inherency of the temporary holding surface. However, "temporary holding surface is broad and as Jiang teaches "the outer die and inner die may be secured to each other prior to being mounted in the first recess". If they are mounted to each other, there must exist some form of temporary holding surface. Without a temporary holding surface, the die would fall to the floor or bottom of the apparatus.

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8. Applicant's arguments filed 12/13/04, with respect to "shingle stack" have been fully considered and are persuasive. The objection of claim 15 has been withdrawn.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile

number all patent correspondence to be entered into an application is (703) 872-9306.
The facsimile number for customer service is (703)-872-9317.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David S. Blum

March 16, 2005